2.0 DATA SOURCES

A brief description is provided for the major data sources utilized in describing the life histories, EFH information levels, EFH descriptions for each species and life stage, as well as those used for the maps developed with a geographic information system (GIS).

The primary sources of information for the life history descriptions and habitat associations were published reports and gray literature (See Literature Cited section of this appendix). Several reviewers also graciously contributed unpublished information, acknowledged as personal communications.

In general, only large datasets covering many species and a large geographic area of the west coast have been included in GIS maps; in future updates, more limited datasets will be included. GIS maps of species and life stage

distributions, and sometimes frequency of occurrence, were developed from the following datasets:

Triennial and Slope Trawl Surveys

National Marine Fisheries Service (NMFS) has conducted bottom trawl surveys along the west coast to assess the distribution, abundance, and biological characteristics of groundfish. GIS maps of these data were prepared with the assistance of Mark Wilkins, Angie Grieg, Tonya Builder, and Millie Kander (personal communications). Triennial surveys conducted during 1977-1995 and slope surveys conducted in 1984, 1985, 1989, 1991-1993, 1995, and 1996 were included for the maps. See Dark and Wilkins [67], Weinberg, et al. [385] and Zimmerman, et al. [406] for a description of the triennial surveys. A GIS map showing the distribution of all hauls for triennial surveys and for slope

surveys (all years combined) follows in this section. To evaluate the frequency of occurrence of species in particular depth-latitude strata, GIS maps showing the number of hauls in each depth zone and 30 minutes of latitude are also included separately for the triennial and slope surveys in this section. Frequency of occurrence represents the percentage of hauls, in which a species was caught, of the total number of hauls made in a stratum

Survey results for those species among the 83 groundfish specifically identified in the FMP were utilized; some of the 83 species were not caught during these surveys and several were infrequently caught. GIS maps showing the distributions of species in survey catches were included only for those species with 10 or more total observations during these surveys. GIS maps showing the frequencies of occurrence are included only for those species

which were taken in more than 500 hauls during triennial surveys or species which were taken in more than 250 hauls during slope trawl surveys.

CalCOFI Ichthyoplankton Surveys

The California Cooperative Oceanic Fisheries Investigations unit has conducted standardized ichthyoplankton surveys, primarily offshore of California and Baja California since 1951. Survey methods and results are described by Moser, et al. [248]. GIS maps of egg and larval distributions of managed species were developed from data collected during these surveys (H.G. Moser, Jim Kellogg, and Rich Cosgrove, personal communications). A GIS map showing all the sampled locations during the CalCOFI and NMFS (see below) surveys follows in this section. CalCOFI and NMFS

ichthyoplankton data are mapped together when a species was taken in both research surveys.

NMFS Icthyoplankton Surveys

Research surveys extending from the Strait of Juan de Fuca to northern California and offshore to the boundary of the Exclusive Economic Zone (200 miles) have been conducted periodically during the 1980s. They were intended to complement the egg and larval data obtained from the CalCOFI ichthyoplankton surveys and NMFS conducted these surveys cooperatively with the Soviet Pacific Research Institute. Survey methods and their results are described by Doyle [73]; data on egg and larval distribution (Brian Urbain, personal communication) were used to develop the GIS maps of NMFS ichthyoplankton survey results in this appendix.

NOAA Data Atlas for the West Coast

For several commercially valuable species of groundfish off the west coast, a data atlas [260] of cartographic maps showing the known distributions of their important life stages is available. Data from the National Ocean Service (Mark Monaco and Stephen Brown, personal communications) for these cartographic maps were used to generate their counterparts as GIS maps in this appendix. Data sources and methods used to develop the cartographic maps are described in the atlas [260]. These data were mapped with the assistance of Stephen Brown, Chris Perle, and Heidi Johnson (personal communications).

Trawl Logbook Data

Summarized logbook data on landed catch (pounds) and effort (hours) by the commercial trawl fishery were obtained with permission

from the states of Washington, Oregon and California. Data for 1996, the most recent year for which data from all states were available, were used to map reported catch and effort levels in statistical reporting blocks (usually 10-minute squares) along the west coast. These data were provided and mapped through the assistance of Jon Brodziak (personal communication).

These data are only the catches and effort reported in logbook records received by the states and do not reflect the entire catch and effort by the commercial trawl fishery in 1996. A limited number of species are identified and reported separately in the logbook data; catches may be reported for species groups, such as miscellaneous rockfish. GIS maps of miscellaneous rockfish species are shown in this section. Catch-per-unit-effort (CPUE) was calculated as the mean of the CPUE values for each trawl logbook record.

Other Fisheries

Landed catch and number of landings by the 1996 commercial hook-and-line fishery off the west coast are summarized in maps for typical port groupings from the PacFIN database (Jim Hastie, personal communication).

Figure 1.a. Distribution of hauls in NMFS triennial and slope surveys, 1977-1995.

Figure 1.b. Number of hauls by depth and 30 minute latitude blocks in NMFS triennial surveys, 1977-1995.

Figure 1.c. Number of hauls by depth and 30 minute latitude blocks in NMFS slope surveys, 1984-1996.

Figure 1.e. Sampling locations for NMFS (1980-1987) and CalCOFI (1951-1997)

ichthyoplankton surveys.

Figure 1. j. Commercial hook and line groundfish catch and no. of landings by port, 1996.

Figure 1.k. Distribution of all species catch (lb) by statistical block, 1996 trawl logbook reports.

Figure 1.l. Distribution of Misc. Rockfish catch (lb) by statistical block, 1996 trawl logbook reports.

Figure 1.m. Distribution of fishing effort (hr) by statistical block, 1996 trawl logbook reports.

Figure 1.n. Distribution of mean CPUE (lb/hr) of all species by statistical block, 1996 trawl logbook reports.